UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/701,192	11/04/2003	Venkat Selvamanickam	05005469.003US1	5066

29737 7590 06/13/2005

SMITH MOORE LLP
P.O. BOX 21927
GREENSBORO, NC 27420

EXAMINER	
BUEKER, RICHARD R	
ART UNIT	**PAPER NUMBER**
1763	

DATE MAILED: 06/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/701,192	SELVAMANICKAM, VENKAT	
	Examiner	Art Unit	
	Richard Bueker	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 January 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-67* is/are pending in the application.

4a) Of the above claim(s) *43-63 and 65-67* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-42 and 64* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *2/6/04 and 3/28/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not). It is noted that the originally filed claims failed to include a claim numbered 33. Therefore, misnumbered claims 34-68 have been renumbered as 33-67. Please note that the claim numbers referred to in the restriction requirements used the incorrect original claim numbering, and therefore the claim numbers referred to in these office actions, and in applicant's responses thereto, should be adjusted accordingly. The elected claims are claims 1-41 and the linking claims are 1, 42 and 64.

The drawings are objected to because Fig. 1 includes two different parts of the illustrated apparatus that are labeled "14". Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either

"Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim 15 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 15 does not further limit claim 11. It is noted that "a plurality" is defined as "at least two".

Claim 29 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The specification does not make clear what kind of "spacer" is intended in claim 29.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 11, 15, 26-35, 38, 40 and 41 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Savvides (2004/0168636) (Figs. 3-6, for example), who discloses a tape manufacturing apparatus including plural deposition sources and at least one assist source for depositing a biaxially textured buffer layer. Savvides teaches (para. 64) that in his embodiments described in Figs. 3-6, the vapor of atoms may be supplied by electron beam (e-beam) evaporation, and this teaching anticipates or at least makes obvious the apparatus of applicant's claims 1, 11, 15, 26-35, 38, 40 and 41. Regarding claim 29, the assist sources of Savvides are spaced apart.

Claims 1, 11-15, 23-35, 38, 40 and 41 are rejected under 35 U.S.C. 103(a) as obvious over Savvides (2004/0168636) taken in view of Do (6,190,752) and Hammond I (Proc. 8th Int. Symp. Supercond.) This rejection including Do and Hammond I is presented to provide further detailed evidence of the obviousness of the present claims. Do (Fig. 1 and col. 4, lines 11-59, for example) in particular teaches how to deposit a biaxially textured buffer layer by e-beam deposition. Furthermore, Hammond I discusses the formation of IBAD buffer layers, and he suggests the use of e-beam deposition, and he also suggests (page 1029, last para.) that the buffer layer coating zone be as wide as possible and as long as 12 meters (page 1031, para. 3). This presupposes the use of plural e-beam sources. It would have been obvious to one skilled in the art to modify the apparatus of Figs. 3-6 of Savvides to use e-beam

sources, in view of Savvides' para. 64 suggestion, and in view of Do's teaching that IBAD buffer layers can successfully be deposited by use of e-beam sources. It would have been further obvious to use a plurality of Do's sources in view of Hammond's teaching that the buffer layer coating zone should be larger than would have been possible with one source. Do also teaches (col. 4, lines 20-24) the deposition rates recited in claims 23-25.

Claims 2-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Savvides (2004/0168636) in view of Do (6,190,752) and Hammond I (Proc. 8th Int. Symp. Supercond.) for the reasons stated above, and taken in further view of Ebe (6,294,479). Do (col. 4, lines 40-45) teaches the use of a faraday cup and quartz crystal monitor to monitor the flux of ions and evaporant, respectively. Ebe (col. 5, lines 41-67) teaches that the purpose of such monitors is to provide feedback control of the material sources in a deposition process. It is noted that Hammond I also teaches the use of monitors for control of vapor sources. It would have been obvious to one skilled in the art to use the beam monitors of Do to control the beam sources, in view of the teachings of Ebe and Hammond I.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Savvides (2004/0168636) in view of Do (6,190,752),Hammond I (Proc. 8th Int. Symp. Supercond.) and Ebe (6,294,479) for the reasons stated above, taken in further view of Jacobson (4,841,908). Jacobson (col. 5, lines 1-5) teaches the use of a system controller to control a variety of parameters (including the web speed as recited in claim 7) in a vacuum coating system. It would have been obvious to use a system controller of the

type taught by Jacobson to control the system of Savvides, because Jacobson makes clear that a multi-function system can successfully be controlled by using a multi-function system controller.

Claims 8-10, 16-22 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Savvides (2004/0168636) in view of Do (6,190,752) and Hammond I (Proc. 8th Int. Symp. Supercond.) for the reasons stated above, and taken in further view of Muller (3,303,320), Wakamoto (JP 06-192823) and Bischer (5,262,194). Hammond I teaches that it is desirable to widen an IBAD buffer layer deposition zone, and for that reason it would have been obvious to do so in the apparatus of Savvides. Furthermore, Muller (Figs. 1-3 and col. 2, lines 38-41, for example), Wakamoto (Figs. 1-3 and abstract) and Bischer (Figs. 1 and 2) teach the use of plural distributed e-beam vapor sources positioned to widen the deposition zone for coating a moving tape and to achieve uniformity of deposition across the tape. It would have been obvious to widen the deposition zone of Savvides by providing plural e-beam sources in view of Muller, Wakamoto and Bischer.

Claims 29, 36 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Savvides (2004/0168636) taken in view of Do (6,190,752) and Hammond I (Proc. 8th Int. Symp. Supercond.) for the reasons stated above, taken in further view of Wahlin (2003/0193294) (see Figs. 1A and 1B and paragraphs 2 and 32, for example) who discloses a radio frequency argon ion beam source for forming superconductor layers that is optimized for mass production. It includes a collimating grid positioned in spaced relationship to an exit grid to collimate species beamlet. Regarding claim 29, it is noted

that Wahlin's grid includes spacers. It would have been obvious to use an oxygen beam assist source of the type taught by Wahlin as the oxygen beam assist source in the type of apparatus taught by Hammond I for the desirable purpose of facilitating mass production as desired by Hammond I.

Claims 1-6 and 23-41 rejected under 35 U.S.C. 103(a) as being unpatentable over Hammond I (Proc. 8th Int. Symp. Supercond.) taken in view of Furukawa (5,227,363), Murakami (4,888,202) and Hammond II (2003/0054105). Hammond I (see Fig. 1) discloses a superconductor tape manufacturing apparatus comprising at least two vapor deposition sources. Hammond teaches (page 1030, lines 1 and 2) that the vapor sources can be electron beam heated deposition sources. Hammond also teaches the use of an atomic oxygen source, which is an "assist source" as described by applicant. It is noted that page 6, lines 17-19 of applicant's specification describes an assist source as a source that induces a change in the coating. Hammond's oxygen source meets this description. Hammond I doesn't explicitly describe his oxygen source as "communicating a beam". Furukawa (Figs. 1 and 2 and col. 2, lines 37-39), Murakami (Fig. 1 and col. 4, lines 43-46) and Hammond II (Fig. 3) each also discloses a superconductor manufacturing apparatus having electron beam sources and an atomic oxygen assist source, and they teach that an oxygen source in this type of apparatus is a beam source. It would have been obvious to provide Hammond's oxygen source as a beam source because Furukawa and Murakami teach that a beam source can successfully be used for Hammond's purpose. Claim 23-25 recites process limitations that do not limit the claimed apparatus. Regarding the two assist sources recited in

claims 27-34, Hammond I teaches that a large deposition zone should be provided, and the use of plural assist sources to provide a larger zone would have been additive and obvious in view of the teachings of Hammond I. regarding claim 35, Murakami teaches the use of an ion source. Regarding claim 37, Wahlin teaches the use of a collimator.

Claims 2-7 and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hammond I (Proc. 8th Int. Symp. Supercond.) in view of Furukawa (5,227,363), Murakami (4,888,202) and Hammond II (2003/0054105) as stated above, taken in further view of Hammond II (2003/0054105) and Jacobson (4,841,908). Hammond II (Fig. 3) teaches the use of controllers for sources of the type used by Hammond I, and it would have been obvious to use the Hammond II controllers to control the Hammond I sources. Also, Jacobson (col. 5, lines 1-5) teaches the use of a system controller to control a variety of parameters (including the web speed as recited in claim 7) in a vacuum coating system. It would have been obvious to use a system controller of the type taught by Jacobson to control the Hammond I system, because Jacobson makes clear that a multi-function system can successfully be controlled by using a multi-function system controller. Regarding claims 23-25, Hammond II teaches the use of deposition rates within these ranges.

Claims 8-22 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hammond I (Proc. 8th Int. Symp. Supercond.) taken in view of Furukawa (5,227,363), Murakami (4,888,202) and Hammond II (2003/0054105), and optionally in further view of Muller (3,303,320), Wakamoto (JP 06-192823) and Bischer (5,262,194). Hammond I (Fig. 1, page 1030, first para., and page1031, lines 1-9) teaches the use of

plural distributed e-beam vapor sources positioned to increase the deposition zone for coating a moving tape. Muller (Figs. 1-3 and col. 2, lines 38-41, for example), Wakamoto (Figs. 1-3 and abstract) and Bischer (Figs. 1 and 2) teach the use of plural distributed e-beam vapor sources positioned to increase the deposition zone for coating a moving tape and to achieve uniformity of deposition across the tape, and are cited to supplement the disclosure of Hammond I. It would have been obvious to provide the plural e-beam sources of Hammond I as necessary to achieve a larger deposition zone with the desired level of coating uniformity, in view of Hammond I alone or in combination with Muller, Wakamoto and Bischer.

Claim 42 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Nakatani (JP 01-208456) or Tsukamoto (JP 03-13567), each of whom discloses an e-beam deposition source comprising an in-process repairable deposition source. It is noted that the reference to an HTS tape manufacturing system in claim 42 is a recitation of intended use, which the apparatus of Nakatani and Tsukamoto have an inherent or at least obvious capability of performing.

Claims 42 and 64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hammond I (Proc. 8th Int. Symp. Supercond.) taken in view of Nakatani (JP 01-208456) or Tsukamoto (JP 03-13567), each of whom discloses an e-beam deposition source comprising an in-process repairable deposition source. It would have been obvious to use an in-process repairable e-beam source in an apparatus of the type discussed by Hammond I, because Hammond I desires high productivity for his mass

production coating apparatus, and an in-process repairable e-beam source of the type taught by Nakatani and Tsukamoto is designed to reduce down-time and increase productivity of a mass production coating apparatus.

Claims 1-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Selvamanikam I (2004/0258851), II (2004/0261708), III (2004/0261707) and/or IV (2005/0011747), taken in view of Savvides (2004/0168636), Do (6,190,752), Hammond I (Proc. 8th Int. Symp. Supercond.) and Hammond II (2003/0054105). The Selvamanikam references disclose apparatus for forming superconductor tapes using a plurality of sources. The cited secondary references also teach apparatus for forming superconductor tapes, and the secondary references make obvious the use of plural e-beam sources to form the desired coatings. It would have been obvious to modify the apparatus of Selvamanikam I, II, III and IV such that plural e-beam sources were used to deposit the desired coatings.

The applied Selvamanikam references have a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application

application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

Any potential obviousness-type double patenting issues with respect to the claims under examination will be held in abeyance until allowable subject matter has been more clearly defined.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard Bueker whose telephone number is (571) 272-1431. The examiner can normally be reached on 9 AM - 5:30 PM, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parvis Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Richard Bueker
Primary Examiner
Art Unit 1763